WESTON
DESIGNERS CONSULTANTS
SUITE 306, GATEWAY CENTRE II
4TH & STATE AVENUE
KANSAS CITY, KS 66101
PHONE: 913-621-6240

TO: William Keffer, Chief, EP&R/ENSV — October 19, 1983

FROM: Michael G. Clemons, Region VII TAT — TAT-07-F-00214

SUBJECT: Sampling of material located in a 12,000 gallon gasoline storage tank Holden, Missouri TDD #07-8310-12

At 0800 hours on October 13, 1983, the Environmental Protection Agency (EPA) dispatched the Region VII Technical Assistance Team (TAT) to Holden, Missouri to sample a gasoline storage tank whose contents caused 14 people to be admitted to St. Joseph's Hospital for treatment. Michael Clemons, Russ Krohn and George Hess responded to the Holden, Missouri site.

The tank was located in a PCB drum storage warehouse of the Carolan Company, located at 500 West McKissock, Holden, Missouri.

The TAT team arrived on scene at 0945 hours. After conferring with Holden Police Chief Ron Flippin and Johnson County Sheriff, Charles Norman, the TAT entered the warehouse with Dwight Thomas, Head of Research and Development with the Carolan Company, and Tony Lerda, Missouri Department of Natural Resources (MDNR).

The recently acquired gasoline storage tank had been pushed into the warehouse for cleaning before the Carolan Company put it into use. On October 12, 1983, Terry Bryant, an employee of the Carolan Company, was lowered into the tank by a rope. Bryant, reportedly outfitted with a full face respirator and organic vapor cartridges and a plastic rainsuit, immediately became disoriented, lost hold of the rope and passed out. Rescue workers picked up Bryant who had been lying in approximately 4-5 inches of sludge and liquid material.

Bryant, the rescue workers, and the ambulance personnel who came in contact with the liquid from the tank, exhibited one or more of the following acute exposure symptoms:

Blistering/rash/red splotches
Nausea/white foamy vomit
Severe stomach cramps/diarrhea
Headache
Muscle cramps
Stiff joints

According to Mr. Thomas, the only material ever stored in the tank was premium, leaded gasoline. He had purchased the tank from the Dyer Oil Company, located at 801 Southeast 291 Highway, Lee's Summit, Missouri, 816/524-3466.

The TAT observed the tank in question. The tank was cylindrical in shape with a conical top. It measured approximately 18 feet tall and 12 feet in diameter with a 12,000 gallon capacity. The only entrance to the tank was a manhole on the top cone-shaped surface. The TAT, outfitted in level B, lowered a weighted-bottle sampler from the top manhole in an attempt to obtain a sample from a small pool of liquid still floating on the sludge, but was unsuccessful. The TAT then lowered the sampling dredge and obtained a sample from the sludge (sample #AK0101).

Preliminary readings from inside the tank were as follows: 130 ppm of organic vapors according to the Hnu photoionization detector as calibrated to benzene with an 11.7 eV probe. Oxygen readings were 20% and vapors read 15% of the Lower Explosive Limit (LEL) as read by the Edmont Ecolyzer 0_2/explosimeter. The explosimeter is calibrated to methane.

The material sampled had a pH of 2.5 as taken with Panpeha pH indicator strips. The Carolan Company took a mass spectrum reading of material checking for Polychlorinated Biphenyls (PCB's) on October 12, 1983, after the incident occurred. They reported no PCB's (see data sheet in Appendix) and a pH of 6.5-7.5. Mr. Thomas asked for a split sample (see receipt in Appendix).

A meeting was then held with Holden city officials and the TAT concerning the tank incident and the operation of the Rose Chemical Company PCB destruction facility located in the same complex. The Rose Chemical Company and the Carolan Company are apparently owned by the same person. There was some concern exhibited by the city officials of the integrity of the companies in light of their past spill history as well as legal liabilities posed on the City since the City leases the property to the two companies.

The TAT gave the Holden city officials the number of Leo Alderman, who is in EPA's Toxics and Pesticides Branch (TOPE), for further assistance with their questions concerning the PCB facility.

The Holden officials were also concerned about their immediate health hazards after having been exposed to the material from the tank. The TAT contacted Edward Skowronski, EPA's Region VII representative from the Center for Disease Control (CDC) and informed him of the situation through William Keffer, Chief, EPA/EP&R. The TAT left Holden at 1530 and rushed the sample to EPA's Region VII laboratory for analysis. EPA's Emergency Planning and Response team's involvement in the incident is closed at this point.

The Occupational Safety and Health Administration (OSHA) had been contacted and was in the process of inspecting the facility while the TAT was on scene.

Michael G. Clemons

MICHAEL G. CLEMONS
Region VII TAT

David N. Cargo

Reviewed by David N. Cargo
Region VII TATL

Attachments

MGC/dm

OFFICIAL CONTACTS ON SCENE

TONY LERDA
MDNR
615 East 13th Street
Kansas City, MO 64106
816/274-6675

CHIEF FLIPPIN
Holden, Missouri Police Dept.
816/732-4154

CHIEF DAY
Holden, Missouri Fire Dept.
816/732-5527

DWIGHT THOMAS
Head of Research & Development
Carolan Company
500 West McKissock
Holden, MO 64040
816/732-4117

WALTER C. DENNIS
OSHA
12th Floor, 1150 Grand Ave.
Kansas City, MO 64106
816/374-2756

CHARLES NORMAN
Johnson County, Missouri Sheriff
816/782-5000

MEETING ATTENDEES - 10/13/83 - HOLDEN, MISSOURI

Harold Fisher, Johnson County Sheriff
Charlie Norman, Johnson County Sheriff
Mike Droege, Holden Fire Department
Raymond Dacy, Holden Fire Chief
Mike Guddle, Holden Fire Department
Sherry Kane, Holden Ambulance Director
Glen Hite, Holden Police Department
Linda Leavy, Holden Police Department
Ron Flippin, Holden Police Department
Don Hancock, Mayor of Holden
Roy Sturgis, Councilman
Jim Williams, Councilman

WESTON SPER

Region VII
Date 10-13-83
TDD# 07-8310-12

SAFETY PLAN

A.- Incident Description

1. Location Carolan Co. 500 W. M'Kissock Holden, MO 64040
2. Date 10-13-83
3. Type: Spill ☐ Fire ☐ HW Site ☐ Other 12,000 tank
4. Status Reg. VII TAT & EPER/EPA Portion closed
5. Response Objectives Sample Material in tank
6. Background Review: Complete ☑ for material known to be in tank Partial ☐
   If partial, why?
7. Hazard Level: High ☐ Moderate ☑ Low ☐ Unknown ☐
   Inhalation ☑ Ingestion ☑ Contact ☑ External ☐
8. Site Plan/Sketch Attached Yes ☐ No ☑
9. Background Material attached Yes ☑ No ☐

B. Material Description

1. Type: Liquid ☑ Solid ☐ Sludge ☑ Vapor/Gas ☑
2. Chemical Name/Class Premium leaded gasoline & unknown - possibly TETRAETHYL LEAD
3. Characteristics: Corrosive ☑ Ignitable ☑ Volatile ☑
   Toxic ☑ Reactive ☐ Biological Agent ☐
4. Toxicity: TLV IDLH
5. Special Hazards Apparently breakdown of chemical or unknown chem involved
6. Acute Exposure Symptoms blistering, nausea, white foamy vomit, stomach cramps, muscle cramps, diarrhea, stiff joints, head ache - similar to lead poisoning. - Symptoms Exhibited by 14 affected people.

SMG:ss
11/24/82

RFW RSW-396-1182

C. Site Description

1. Size 12,000 gal upright TANK - Approximately 18' x 12'
2. Surrounding Population In rural community of approx 2,089 people
3. Buildings/Homes Several warehouse & PCB/Chemical facilities
4. Topography N/A
5. Receiving Waters N/A
6. Weather N/A
7. Unusual Features 14 people who came in physical contact with material TANK were hospitalized with the recorded symptoms. TANK located in warehouse
8. Site History Boy was lowered into tank to clean it & passed out. Rescuers of boy obtained recorded symptoms from contact with material. Only reported substance in tank for last 20 years was premium leaded gasoline.

D. Personnel Protection

1. Entry Level of Protective clothing : A ☐ B ☑ C ☐ D ☐
2. If not B, why? _____
3. Site Instrument Readings:

% O2	20% in TANK	% LEL	5% in TANK
Radioactivity		HNU	120 ppm at drain plug
OVA		Other	pH 2.5

4. Was protective level up or downgraded: Yes ☐ No ☑
   Up or Down graded to: A ☐ B ☐ C ☐ D ☐
   Why _____
   Actual Change: _____
5. Respirator Protective Equipment:

SCBA	✓		
Gas Mask		Canister Type	
Ultra Twin		Cartridge Type	
Dust Mask			

6. Protective Clothing:

Acid Suit (PVC)	Viton gloves	
Neoprene Boots	Blue nitrile gloves	
Bunker/ PVC Gloves		

7. Field Monitoring Equipment and Materials:

Edmont Ecolyzer	Sample dredge	
Hnu		
weighted bottle sampler		

E. Decontamination Procedures

1. Attach sketch showing Exclusion Zone, Contamination Reduction Zone, Support Zone and numerically labelled Decontamination Stations.
   Material used placed in plastic bags until Analysis
2. For each decontamination station note procedure and materials needed on an attachment page.

F. General Information

1. Team members

M. Ke Clemons Team Leader	
Russ Kuhn	
George Hess	

2. Site Safety Coordinator Clemons

G. Emergency Information

1. Have nearby people been evacuated: Yes ☑ No ☐
   If yes ever how large an area Just Evacuated warehouse
2. First Aid Instructions See Data Sheets
3. Sources of help

	Name	Town	Phone	Notified Yes	No
Fire		HOLDEN	816/732-5527		
Police		↓	816/732-4154 On Scene	on scene	
Ambulance				Daytime	
Hospital	St. Joseph	KC, MO	816/942-4400	Daytime	
Poison Information					
Airport					
Heliport	St. Joseph Life line	KC, MO	Thru Ambulance	Daytime	
Site Telephone		HOLDEN			
Nearest Telephone					

4. Emergency Telephone Numbers

WESTON Hot Line	215-524-1925 or 1926
WESTON NPO	215-431-0797 or 0798 or 692-3030
P. B. Lederman - NPM	201-665-0359 (Home)
S. M. Gertz - HSO	215-667-5461 (Home)
Medical Emergency	513-421-3063 (National Service)
EPA - ERT Emergency	201-321-6660
Chemtrec	800-424-9300
Central Disease Control	404-329-3311 (day) 404-329-3644 (night)
National Pesticide Medical Emergency	800-845-7633 (Regional Service)

Prepared by Mike Clemens
Date 10-13-83

Approved by Carol A. Stratman
Date 10-24-83

(For HSO Use Only)

Reviewed and Comments _____

Action Required? Yes ☐ No ☐ If yes, what action _____

Followup carried out? Date _____

_____ _____
S. O. Signature Date

GAT

GASOLINES: AUTOMOTIVE

(< 4.23g lead/gal)

Common Synonyms

Watery liquid Colorless to pale brown or pink Gasoline odor

Floats on water. Flammable, irritating vapor is produced.

Stop discharge if possible. Keep people away.
Shut off ignition sources and call fire department.
Stay upwind and use water spray to "knock down" vapor.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

Fire

FLAMMABLE.
Flashback along vapor trail may occur.
Vapor may explode if ignited in an enclosed area.
Extinguish with dry chemical, foam, or carbon dioxide.
Water may be ineffective on fire.
Cool exposed containers with water.

Exposure

CALL FOR MEDICAL AID.

VAPOR
Irritating to eyes, nose and throat.
If inhaled, will cause dizziness, headache, difficult breathing or loss of consciousness.
Move to fresh air.
If breathing has stopped, give artificial respiration.
If breathing is difficult, give oxygen.

LIQUID
Irritating to skin and eyes.
If swallowed, will cause nausea or vomiting.
Remove contaminated clothing and shoes.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.
IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk.
DO NOT INDUCE VOMITING.

Water Pollution

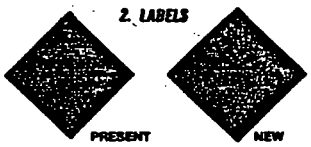
HARMFUL TO AQUATIC LIFE IN VERY LOW CONCENTRATIONS.
Fouling to shoreline.
May be dangerous if it enters water intakes.
Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook, CG 446-6)

Issue warning—high flammability
Evacuate area
Disperse and flush

2. LABELS



3. CHEMICAL DESIGNATIONS

3.1 **Synonyms:** Motor spirit
Petrol

3.2 **Coast Guard Compatibility Classification:** Petroleum oils

3.3 **Chemical Formula:** (Mixture of hydrocarbons)

3.4 **IMCO/United Nations Numerical Designation:** 3.1/1203.

4. OBSERVABLE CHARACTERISTICS

4.1 **Physical State (as shipped):** Liquid

4.2 **Color:** Colorless to brown

4.3 **Odor:** Gasoline

5. HEALTH HAZARDS

5.1 **Personal Protective Equipment:** Protective goggles, gloves.

5.2 **Symptoms Following Exposure:** Irritation of mucous membranes and stimulation followed by depression of central nervous system. Breathing of vapor may also cause dizziness, headache, and incoordination or, in more severe cases, anesthesia, coma, and respiratory arrest. If liquid enters lungs, it will cause severe irritation, coughing, gagging, pulmonary edema, and, later, signs of bronchopneumonia and pneumonitis. Swallowing may cause irregular heartbeat.

5.3 **Treatment for Exposure:** INHALATION: maintain respiration and administer oxygen; enforce bed rest if liquid is in lungs. INGESTION: do NOT induce vomiting; stomach should be lavaged (by doctor) if appreciable quantity is swallowed. EYES: wash with copious quantity of water. SKIN: wipe off and wash with soap and water.

5.4 **Toxicity by Inhalation (Threshold Limit Value):** No single TLV applies.

5.5 **Short-Term Inhalation Limits:** *500 ppm for 30 min.*

5.6 **Toxicity by Ingestion:** Grade 2: LD_{50} 0.5 to 5 g/kg.

5.7 **Late Toxicity:** None

5.8 **Vapor (Gas) Irritant Characteristics:** Vapors cause a slight smarting of the eyes or respiratory system if present in high concentrations. The effect is temporary.

5.9 **Liquid or Solid Irritant Characteristics:** Minimum hazard. If spilled on clothing and allowed to remain, may cause smarting and reddening of the skin.

5.10 **Odor Threshold:** 0.25 ppm

6. FIRE HAZARDS

6.1 **Flash Point:** −36°F C.C.

6.2 **Flammable Limits in Air:** 1.4%—7.4%

6.3 **Fire Extinguishing Agents:** Foam, carbon dioxide, dry chemical

6.4 **Fire Extinguishing Agents Not to be Used:** Water may be ineffective

6.5 **Special Hazards of Combustion Products:** None

6.6 **Behavior in Fire:** Vapor is heavier than air and may travel considerable distance to a source of ignition and flash back.

6.7 **Ignition Temperature:** 853°F

6.8 **Electrical Hazard:** Class I, Group D

6.9 **Burning Rate:** 4 mm/min.

7. CHEMICAL REACTIVITY

7.1 **Reactivity with Water:** No reaction

7.2 **Reactivity with Common Materials:** No reaction

7.3 **Stability During Transport:** Stable

7.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent

7.5 **Polymerization:** Not pertinent

7.6 **Inhibitor of Polymerization:** Not pertinent

8. WATER POLLUTION

8.1 **Aquatic Toxicity:**
90 ppm/24 hr/juvenile American shad/ TL_m/fresh water
91 mg/l /24 hr/juvenile American shad/ TL_m/salt water

8.2 **Waterfowl Toxicity:** Data not available

8.3 **Biological Oxygen Demand (BOD):** 8%, 5 days

8.4 **Food Chain Concentration Potential:** None

9. SELECTED MANUFACTURERS

1. Exxon Co.
30 Rockefeller Plaza
New York, N. Y. 10020
2. Shell Oil Co.
1 Shell Plaza
Houston, Texas 77001
3. Sun Oil Co.
St. Davids, Pa. 19087

10. SHIPPING INFORMATION

10.1 **Grades or Purity:** Various octane ratings; military specifications

10.2 **Storage Temperature:** Ambient

10.3 **Inert Atmosphere:** No requirement

10.4 **Venting:** Open (flame arrester) or pressure-vacuum

11. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook, CG 446-5)

A-T-U-V-W

12. HAZARD CLASSIFICATIONS

12.1 **Code of Federal Regulations:** Flammable liquid

12.2 **NAS Hazard Rating for Bulk Water Transportation:**

Category	Rating
Fire	3
Health	
Vapor Irritant	1
Liquid or Solid Irritant	1
Poisons	2
Water Pollution	
Human Toxicity	1
Aquatic Toxicity	2
Aesthetic Effect	2
Reactivity	
Other Chemicals	0
Water	0
Self-Reaction	0

12.3 **NFPA Hazard Classifications:**

Category	Classification
Health Hazard (Blue)	1
Flammability (Red)	3
Reactivity (Yellow)	0

13. PHYSICAL AND CHEMICAL PROPERTIES

13.1 **Physical State at 15°C and 1 atm:** Liquid

13.2 **Molecular Weight:** Not pertinent

13.3 **Boiling Point at 1 atm:** 140—390°F = 60—199°C = 333—472°K

13.4 **Freezing Point:** Not pertinent

13.5 **Critical Temperature:** Not pertinent

13.6 **Critical Pressure:** Not pertinent

13.7 **Specific Gravity:** 0.71—0.747 at 20°C (liquid)

13.8 **Liquid Surface Tension:** 19—23 dynes/cm = 0.019—0.023 N/m at 20°C

13.9 **Liquid-Water Interfacial Tension:** 49—51 dynes/cm = 0.049—0.051 N/m at 20°C

13.10 **Vapor (Gas) Specific Gravity:** 3.4

13.11 **Ratio of Specific Heats of Vapor (Gas):** (est.) 1.054

13.12 **Latent Heat of Vaporization:** 130—150 Btu/lb = 71—81 cal/g = 3.0—3.4 × 10^5 J/kg

13.13 **Heat of Combustion:** −18,720 Btu/lb = −10,400 cal/g = −435.1 × 10^5 J/kg

13.14 **Heat of Decomposition:** Not pertinent

13.15 **Heat of Solution:** Not pertinent

13.16 **Heat of Polymerization:** Not pertinent

(Continued on pages 5 and 6)

NOTES

TEL — TETRAETHYL LEAD

Common Synonyms			
TEL Lead tetraethyl	Oily liquid	Colorless, but generally dyed red	Fruity odor

Sinks in water. Poisonous, flammable vapor is produced.

AVOID CONTACT WITH LIQUID AND VAPOR. Keep people away.
Wear goggles, self-contained breathing apparatus, and rubber overclothing (including gloves).
Stop discharge if possible.
Call fire department.
Stay upwind and use water spray to "knock down" vapor.
Isolate and remove discharged material.
Notify local health and pollution control agencies.

Fire

Combustible.
POISONOUS GASES ARE PRODUCED IN FIRE.
Containers may explode in fire.
Vapor may explode if ignited in an enclosed area.
Wear goggles, self-contained breathing apparatus, and rubber overclothing (including gloves).
Combat fires from behind barrier or protected location.
Flood discharge area with water.
Extinguish with water, dry chemical, foam, or carbon dioxide.
Cool exposed containers with water.

Exposure

CALL FOR MEDICAL AID.

VAPOR
POISONOUS IF INHALED OR IF SKIN IS EXPOSED.
Irritating to eyes.
Move to fresh air.
If breathing has stopped, give artificial respiration.
If breathing is difficult, give oxygen.

LIQUID
POISONOUS IF SWALLOWED OR IF SKIN IS EXPOSED.
Will burn eyes.
Remove contaminated clothing and shoes.
Flush affected areas with plenty of water.
IF IN EYES, hold eyelids open and flush with plenty of water.
IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk and have victim induce vomiting.
IF SWALLOWED and victim is UNCONSCIOUS OR HAVING CONVULSIONS, do nothing except keep victim warm.

Water Pollution

HARMFUL TO AQUATIC LIFE IN VERY LOW CONCENTRATIONS.
May be dangerous if it enters water intakes.
Notify local health and wildlife officials.
Notify operators of nearby water intakes.

1. RESPONSE TO DISCHARGE

(See Response Methods Handbook, CG 448-4)

Issue warning—poison, water contaminant
Restrict access
Should be removed
Chemical and physical treatment

2. LABELS

PRESENT NEW

3. CHEMICAL DESIGNATIONS

3.1 **Synonyms:** Lead tetraethyl
3.2 **Coast Guard Compatibility Classification:** Special class
3.3 **Chemical Formula:** $Pb(C_2H_5)_4$
3.4 **IMCO/United Nations Numerical Designation:** 6.1/1649

4. OBSERVABLE CHARACTERISTICS

4.1 **Physical State (as shipped):** Liquid
4.2 **Color:** Dyed red or other distinctive color.
4.3 **Odor:** Sweet

5. HEALTH HAZARDS

5.1 **Personal Protective Equipment:** Organic vapor type canister face mask for short periods; air line type for longer periods; neoprene-coated, liquid-proof gloves; protective goggles or face shield; white or light-colored clothing; rubber shoes or boots.

5.2 **Symptoms Following Exposure:** Increased urinary output of lead. If a large degree of absorption from inhalation or skin contact, may cause insomnia, excitability, delirium, coma and death. *Do not confuse with inorganic lead.*

5.3 **Treatment for Exposure:** Remove victim from contaminated area and consult physician immediately. INGESTION: induce vomiting. SKIN: wash immediately with kerosene or similar petroleum distillate followed by soap and water.

5.4 **Toxicity by Inhalation (Threshold Limit Value):** 0.1 mg/m³

5.5 **Short-Term Inhalation Limits:** Data not available

5.6 **Toxicity by Ingestion:** Data not available

5.7 **Late Toxicity:** Lead poisoning

5.8 **Vapor (Gas) Irritant Characteristics:** Vapors cause a slight *smarting* of the eyes or respiratory system if present in high concentrations. The effect is temporary.

5.9 **Liquid or Solid Irritant Characteristics:** Causes smarting of the skin and first-degree burns on short exposure; may cause secondary burns on long exposure.

5.10 **Odor Threshold:** Data not available

6. FIRE HAZARDS

6.1 **Flash Point:** 200°F C.C.; 185°F O.C.
6.2 **Flammable Limits in Air:** Data not available
6.3 **Fire Extinguishing Agents:** Water, foam, dry chemical, or carbon dioxide
6.4 **Fire Extinguishing Agents Not to be Used:** Not pertinent
6.5 **Special Hazards of Combustion Products:** Toxic gases are generated in fires.
6.6 **Behavior in Fire:** May explode in fires.
6.7 **Ignition Temperature:** Decomposes above 230°F
6.8 **Electrical Hazard:** Not pertinent
6.9 **Burning Rate:** Data not available

7. CHEMICAL REACTIVITY

7.1 **Reactivity with Water:** No reaction
7.2 **Reactivity with Common Materials:** Rust and some metals cause decomposition.
7.3 **Stability During Transport:** Stable below 230°F. At higher temperatures, may detonate or explode when confined.
7.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent
7.5 **Polymerization:** Not pertinent
7.6 **Inhibitor of Polymerization:** Not pertinent

8. WATER POLLUTION

8.1 **Aquatic Toxicity:** 0.20 mg/l /96 hr/bluegill/TL_m/fresh water
8.2 **Waterfowl Toxicity:** Data not available
8.3 **Biological Oxygen Demand (BOD):** Data not available
8.4 **Food Chain Concentration Potential:** Data not available

9. SELECTED MANUFACTURERS

1. E. I. duPont de Nemours & Co., Inc.
   Petroleum Chemicals Division
   Antioch, Calif. 94509
2. Ethyl Corp.
   Industrial Chemicals Division
   451 Florida St.
   Baton Rouge, La. 70801
3. PPG Industries, Inc.
   Houston Chemical Co. Dvision
   Beaumont, Tex. 77704

10. SHIPPING INFORMATION

10.1 **Grades or Purity:** Technical
10.2 **Storage Temperature:** Ambient
10.3 **Inert Atmosphere:** No requirement
10.4 **Venting:** Pressure-vacuum

11. HAZARD ASSESSMENT CODE

(See Hazard Assessment Handbook, CG 448-8)

A-X-Y

12. HAZARD CLASSIFICATIONS

12.1 **Code of Federal Regulations:** *Poisonous liquid or solid, Class B*
12.2 **NAS Hazard Rating for Bulk Water Transportation:** Not listed
12.3 **NFPA Hazard Classifications:**

Category	Classification
Health Hazard (Blue)	3
Flammability (Red)	2
Reactivity (Yellow)	3

13. PHYSICAL AND CHEMICAL PROPERTIES

13.1 **Physical State at 15°C and 1 atm:** Liquid
13.2 **Molecular Weight:** 323.44
13.3 **Boiling Point at 1 atm:** Decomposes
13.4 **Freezing Point:** −215°F = −137°C = 136°K
13.5 **Critical Temperature:** Not pertinent
13.6 **Critical Pressure:** Not pertinent
13.7 **Specific Gravity:** 1.59 at 20°C (liquid)
13.8 **Liquid Surface Tension:** (est.) 40 dynes/cm = 0.04 N/m at 20°C
13.9 **Liquid-Water Interfacial Tension:** (est.) 40 dynes/cm = 0.04 N/m at 20°C
13.10 **Vapor (Gas) Specific Gravity:** Not pertinent
13.11 **Ratio of Specific Heats of Vapor (Gas):** Not pertinent
13.12 **Latent Heat of Vaporization:** Not pertinent
13.13 **Heat of Combustion:** (est.) −7,870 Btu/lb = −4,380 cal/g = −183 × 10³ J/kg
13.14 **Heat of Decomposition:** Not pertinent
13.15 **Heat of Solution:** Not pertinent
13.16 **Heat of Polymerization:** Not pertinent

(Continued on pages 5 and 6)

NOTES

Occupational Health Guideline for Tetraethyl Lead

INTRODUCTION

This guideline is intended as a source of information for employees, employers, physicians, industrial hygienists, and other occupational health professionals who may have a need for such information. It does not attempt to present all data; rather, it presents pertinent information and data in summary form.

SUBSTANCE IDENTIFICATION

- Formula: $Pb(C_2H_5)_4$
- Synonyms: TEL; lead tetraethyl; motor fuel antiknock compound
- Appearance and odor: Colorless liquid (or dyed red, orange, or blue) with a slight musty odor.

PERMISSIBLE EXPOSURE LIMIT (PEL)

The current OSHA standard for tetraethyl lead is 0.075 milligrams of tetraethyl lead per cubic meter of air (mg/m³) averaged over an eight-hour work shift. The American Conference of Governmental Industrial Hygienists has recommended that the permissible exposure limit be changed to 0.1 mg/m³. The American Conference of Governmental Industrial Hygienists has recommended for tetraethyl lead a Threshold Limit Value of 0.1 mg/m³ with a skin notation.

HEALTH HAZARD INFORMATION

- **Routes of exposure**

Tetraethyl lead can affect the body if it is inhaled, comes in contact with the eyes or skin, or is swallowed. It may readily enter the body through the skin.

- **Effects of overexposure**

The absorption by humans of a sufficient quantity of tetraethyl lead either briefly at a high rate or for prolonged periods at a lower rate may cause intoxication. The onset of symptoms may be delayed for up to eight days after termination of exposure. The milder toxic effects are difficulty in sleeping, tiredness, wild dreams, anxiety, trembling, spasms, slow heart beat, low body temperature, paleness, nausea and loss of appetite. More severe intoxication causes episodes of disorientation, hallucinations, grimacing, and intense activity which requires that the person be restrained. These episodes may convert into manic or violent convulsive seizures which may end in unconsciousness or death. Tetraethyl lead may cause irritation of the eyes. Fetal damage may occur from exposure of the mother to tetraethyl lead, by analogy to methyl mercury.

- **Reporting signs and symptoms**

A physician should be contacted if anyone develops any signs or symptoms and suspects that they are caused by exposure to tetraethyl lead.

- **Recommended medical surveillance**

The following medical procedures should be made available to each employee who is exposed to tetraethyl lead at potentially hazardous levels:

1. Initial Medical Examination:

—A complete history and physical examination: The purpose is to detect pre-existing conditions that might place the exposed employee at increased risk, and to establish a baseline for future health monitoring. Persons with a history of mental disorders or hypotension would be expected to be at increased risk from exposure. Examination of the central nervous system and the cardiovascular system should be stressed.

—Urinalysis: Normal kidney function is considered necessary for biologic monitoring. A urinalysis should be obtained to include at a minimum specific gravity, albumin, glucose, and a microscopic on centrifuged sediment. The concentration of lead should be determined. Urine specimens with a specific gravity less than 1.020 should be discarded and another sampled obtained.

2. Periodic Medical Examination: The aforementioned medical examinations should be repeated on an annual basis, except that the determination of lead in the urine should be repeated quarterly.

- **Summary of toxicology**

Tetraethyl lead vapor affects the nervous system and

These recommendations reflect good industrial hygiene and medical surveillance practices and their implementation will assist in achieving an effective occupational health program. However, they may not be sufficient to achieve compliance with all requirements of OSHA regulations.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service Centers for Disease Control
National Institute for Occupational Safety and Health

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration

causes mental aberrations including psychosis, mania, and convulsions. Of 41 female Swiss mice which survived for 36 weeks after a single subcutaneous injection of 0.6 mg, 5 developed malignant lymphomas during the next 15 weeks; the significance of these data cannot be evaluated, because this tumor occurs spontaneously with a variable incidence in the mouse strain used. The absorption by humans of a sufficient quantity of tetraethyl lead, either briefly at a high rate (100 mg/m³ for 1 hour) or for prolonged periods at a lower rate, causes acute intoxication; chronic intoxication has not been observed. The onset of symptoms may be delayed for up to 8 days after termination of exposure. The milder manifestations of intoxication are insomnia, lassitude, lurid dreams, dream-like waking states of anxiety, tremor, hyperreflexia, spasmodic muscular contractions, bradycardia, hypotension, hypothermia, pallor, nausea, and anorexia. More severe intoxication causes recurrent or nearly continuous episodes of disorientation, hallucinations, facial contortions, and intense hyperactivity which requires that the individual be restrained. Such episodes may convert abruptly into manic or violent convulsive seizures which may terminate in coma and death. During intoxication there is a striking elevation of the rate of excretion of lead in the urine but only a negligible or slight elevation of the concentration of lead in the blood. In severe intoxication, the urine lead is rarely less than 350 ug/l of urine, while the blood lead is rarely more than 50 ug/100 g of blood. There is also a total absence of morphological or chemical abnormalities in the erythrocytes, in sharp contrast to intoxication caused by inorganic lead. In a mortality study of 592 workers, the mean exposure time was 17.9 years, and urinary lead levels during this period did not exceed 180 ug/l; the incidence of death in this group and in a control group of employees was less than that expected in the general population, and there were no peculiarities in the specific causes of death in either group. In a similar study of a different cohort of these exposed workers, there were no significant health differences when compared with a control group. Although tetraethyl lead may be irritating to the eyes, this effect is considered insignificant when compared with the effects on the central nervous system.

CHEMICAL AND PHYSICAL PROPERTIES

- **Physical data**

1. Molecular weight: 323.4
2. Boiling point (760 mm Hg): Decomposes above 100 C (212 F)
3. Specific gravity (water = 1): 1.65
4. Vapor density (air = 1 at boiling point of tetraethyl lead): 8.6
5. Melting point: −138 to −130 C (−216 to −202 F)
6. Vapor pressure at 20 C (68 F): 0.2 mm Hg
7. Solubility in water, g/100 g water at 20 C (68 F): Insoluble
8. Evaporation rate (butyl acetate = 1): Data not available

- **Reactivity**

1. Conditions contributing to instability: Temperatures above 100 C (212 F) cause decomposition and development of pressure that may cause containers to burst.
2. Incompatibilities: Contact with strong oxidizers, such as sulfuryl chloride or potassium permangonate, may cause fires and explosions.
3. Hazardous decomposition products: Toxic airborne substances (such as lead fumes and carbon monoxide) may be released in a fire involving tetraethyl lead.
4. Special precautions: Tetraethyl lead will attack some forms of plastics, rubber, and coatings.

- **Flammability**

1. Flash point: 93 C (200 F) (closed cup)
2. Autoignition temperature: Data not available
3. Flammable limits in air, % by volume: Data not available
4. Extinguishant: Dry chemical, foam, carbon dioxide

- **Warning properties**

1. Odor Threshold: No quantitative information is available concerning the odor threshold of tetraethyl lead. The AIHA *Hygienic Guide* states that this substance "has a characteristic sweetish odor, but the intensity of the odor is not adequate to warn of hazardous concentrations."
2. Eye Irritation Level: Grant states that "concerning local effects on the eye from direct contact, there was recorded by Leake in 1926 a strange account of a contamination of the eyes from a splash of gasoline containing tetraethyl lead, after which the patient was said to have been unable to see for three-fourths of an hour. In the course of two months the patient was reported improved and was found to have no corneal or ophthalmoscopic abnormality, but was thought to have slight mydriasis, photophobia, and contraction of the visual field. Very likely the initial difficulty in seeing was due to smarting sensation in the eyes and blepharospasm. The evidence of later eye abnormality in this case seems quite indefinite and questionable.

"I have tested high-test gasoline containing tetraethyl lead by dropping on rabbit eyes, and have found it to cause immediate pain and blepharospasm lasting several minutes. When the application was repeated ten times in the course of five minutes under local anesthesia, it produced conjunctival hyperemia and moderate flocculent discharge, but no damage to cornea or conjunctiva."

3. Evaluation of Warning Properties: Since there is no quantitative information relating warning properties to air concentrations of tetraethyl lead, this substance is treated as a material with poor warning properties.

MONITORING AND MEASUREMENT PROCEDURES

• General

Measurements to determine employee exposure are best taken so that the average eight-hour exposure is based on a single eight-hour sample or on two four-hour samples. Several short-time interval samples (up to 30 minutes) may also be used to determine the average exposure level. Air samples should be taken in the employee's breathing zone (air that would most nearly represent that inhaled by the employee).

• Method

An analytical method for tetraethyl lead is in the *NIOSH Manual of Analytical Methods*, 2nd Ed., Vol. 4, 1978, available from the Government Printing Office, Washington, D.C. 20402 (GPO No. 017-033-00317-3).

RESPIRATORS

• Good industrial hygiene practices recommend that engineering controls be used to reduce environmental concentrations to the permissible exposure level. However, there are some exceptions where respirators may be used to control exposure. Respirators may be used when engineering and work practice controls are not technically feasible, when such controls are in the process of being installed, or when they fail and need to be supplemented. Respirators may also be used for operations which require entry into tanks or closed vessels, and in emergency situations. If the use of respirators is necessary, the only respirators permitted are those that have been approved by the Mine Safety and Health Administration (formerly Mining Enforcement and Safety Administration) or by the National Institute for Occupational Safety and Health.

• In addition to respirator selection, a complete respiratory protection program should be instituted which includes regular training, maintenance, inspection, cleaning, and evaluation.

PERSONAL PROTECTIVE EQUIPMENT

• Employees should be provided with and required to use impervious clothing, gloves, face shields (eight-inch minimum), and other appropriate protective clothing necessary to prevent any possibility of skin contact with undiluted liquid tetraethyl lead or solutions containing more than 1.06 milliliters per liter (4 milliliters per gallon).

• Clothing contaminated with undiluted liquid tetraethyl lead or solutions containing more than 1.06 milliliters per liter (4 milliliters per gallon) should be placed in closed containers for storage until it can be discarded or until provision is made for the removal of tetraethyl lead from the clothing. If the clothing is to be laundered or otherwise cleaned to remove the tetraethyl lead, the person performing the operation should be informed of tetraethyl lead's hazardous properties.

• If employees' clothing has had any possibility of being contaminated with undiluted liquid tetraethyl lead or solutions containing more than 1.06 milliliters per liter (4 milliliters per gallon), employees should change into uncontaminated clothing before leaving the work premises.

• Non-impervious clothing which becomes contaminated with undiluted liquid tetraethyl lead or solutions containing more than 1.06 milliliters per liter (4 milliliters per gallon) should be removed immediately and not reworn until the tetraethyl lead is removed from the clothing.

• Employees should be provided with and required to use splash-proof safety goggles where liquid tetraethyl lead may contact the eyes.

COMMON OPERATIONS AND CONTROLS

The following list includes some common operations in which exposure to tetraethyl lead may occur and control methods which may be effective in each case:

Operation	Controls
Liberation during manufacture in preparation of antiknock agents for fuels	Process enclsoure; local exhaust ventilation; personal protective equipment
Liberation during formulation at petroleum refinery for use as an antiknock agent	Local exhaust ventilation; total enclosure; personal protective devices

EMERGENCY FIRST AID PROCEDURES

In the event of an emergency, institute first aid procedures and send for first aid or medical assistance.

• Eye Exposure

If liquid tetraethyl lead or strong concentrations of tetraethyl lead vapors get into the eyes, wash eyes immediately with large amounts of water, lifting the lower and upper lids occasionally. Get medical attention immediately. Contact lenses should not be worn when working with this chemical.

• Skin Exposure

If liquid tetraethyl lead or strong concentrations of tetraethyl lead vapors get on the skin, immediately rinse the contaminated skin with kerosene or similar petroleum products, if readily available, then wash the skin using soap or mild detergent and water. If liquid tetraethyl lead or strong concentrations of tetraethyl lead vapors penetrate through the clothing, remove the clothing immediately and first rinse the skin with kerosene or similar petroleum products, if readily available, then wash the skin using soap or mild detergent and water. Get medical attention immediately.

• Breathing

If a person breathes in large amounts of tetraethyl lead, move the exposed person to fresh air at once. If breathing has stopped, perform artificial respiration. Keep the affected person warm and at rest. Get medical

attention as soon as possible.

• Swallowing

When tetraethyl lead has been swallowed and the person is conscious, give the person large quantities of water immediately. After the water has been swallowed, try to get the person to vomit by having him touch the back of his throat with his finger. Do not make an unconscious person vomit. Get medical attention immediately.

• Rescue

Move the affected person from the hazardous exposure. If the exposed person has been overcome, notify someone else and put into effect the established emergency rescue procedures. Do not become a casualty. Understand the facility's emergency rescue procedures and know the locations of rescue equipment before the need arises.

SPILL, LEAK, AND DISPOSAL PROCEDURES

• Persons not wearing protective equipment and clothing should be restricted from areas of spills or leaks until cleanup has been completed.

• If tetraethyl lead is spilled or leaked, the following steps should be taken:

1. Ventilate area of spill or leak.
2. For small quantities, absorb on paper towels. Evaporate in a safe place (such as a fume hood). Allow sufficient time for evaporating vapors to completely clear the hood ductwork. Burn the paper in a suitable location away from combustible materials. Large quantities can be collected and atomized in a suitable combustion chamber equipped with an appropriate effluent gas cleaning device.

• Waste disposal methods:

Tetraethyl lead may be disposed of:

1. By absorbing it in vermiculite, dry sand, earth or a similar material and disposing in a secured sanitary landfill.
2. By atomizing in a suitable combustion chamber equipped with an appropriate effluent gas cleaning device.

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RESPIRATORY PROTECTION FOR TETRAETHYL LEAD

Condition	Minimum Respiratory Protection* Required Above 0.075 mg/m³
Vapor Concentration	
0.75 mg/m³ or less	Any supplied-air respirator. Any self-contained breathing apparatus.
3.75 mg/m³ or less	Any supplied-air respirator with a full facepiece, helmet, or hood. Any self-contained breathing apparatus with a full facepiece.
40 mg/m³ or less	A Type C supplied-air respirator operated in pressure-demand or other positive pressure or continuous-flow mode.
Greater than 40 mg/m³** or entry and escape from unknown concentrations	Self-contained breathing apparatus with a full facepiece operated in pressure-demand or other positive pressure mode. A combination respirator which includes a Type C supplied-air respirator with a full facepiece operated in pressure-demand or other positive pressure or continuous-flow mode and an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive pressure mode.
Fire Fighting	Self-contained breathing apparatus with a full facepiece operated in pressure-demand or other positive pressure mode.
Escape	Any gas mask providing protection against organic vapors. Any escape self-contained breathing apparatus.

*Only NIOSH-approved or MSHA-approved equipment should be used.

**Use of supplied-air suits may be necessary to prevent skin contact while providing respiratory protection from airborne concentrations of tetraethyl lead; however, this equipment should be selected, used, and maintained under the immediate supervision of trained personnel. Where supplied-air suits are used above a concentration of 40 mg/m³, an auxiliary self-contained breathing apparatus operated in positive pressure mode should also be worn.

SAX

LEAD PEROXIDE. See lead dioxide.

LEAD PHENATE. Yellowish to grayish-white powder. $Pb(OH)OC_6H_5$, mw: 317.28.
THR = See lead compounds and phenol.

LEAD-*o*-PHOSPHATE. Hexagonal, colorless or white powder. $Pb_3(PO_4)_2$, mw: 811.59, mp: 1014, d: 6.9–7.3.
THR = A poison. See also lead compounds.

LEAD-*m*-PHOSPHATE. Colorless crystals. $Pb(PO_3)_2$, mw: 365.17, mp: 800°.
THR = See lead compounds. An exper (±) carc. [*3, 9*]

LEAD-*o*-PHOSPHITE. White powder. $PbHPO_3$, mw: 287.20, mp: decomp.
THR = See lead compounds and phosphites. A fiber drum of it self-ignited. [*19*]

LEAD PICRATE. Yellow crystals. $Pb(C_6H_2O_7)_2 \cdot H_2O$, mw: 681.43, mp: $-H_2O$ @ 130°, bp: explodes, d: 2.831 @ 20°.
THR = See lead compounds and picric acid.

LEAD PROTOXIDE. See litharge.

LEAD PYROARSENATE. See lead arsenates.

LEAD PYROPHOSPHATE. White crystals. $Pb_2P_2O_7$, mw: 588.38, mp: 824°, d: 5.8.
THR = See lead compounds and phosphates.

LEAD RED. See lead oxide.

LEAD RESINATE. Yellowish-white paste. $Pb(C_{20}H_{29}O_2)_2$, mw: 810.07.
THR = See lead compounds.
Fire Hazard: Mod, when exposed to heat or flame.
Disaster Hazard: See lead.

LEAD SELENATE. White crystals. $PbSeO_4$, mw: 350.17, mp: decomp. d: 6.37.
THR = See lead compounds and selenium compounds.

LEAD SELENIDE. Syn: *clausthalite*. Cubic crystals. PbSe, mw: 286.17, mp: 1065°, d: 8.10 @ 15°.
THR = See lead and selenium compounds.
Fire Hazard: Mod, in the form of dust when exposed to flame or by chemical reaction with moisture to evolve the hydrides. See also hydrogen selenide.
Explosion Hazard: Slight, by chemical reaction with moisture. See also hydrogen selenide.
Disaster Hazard: See lead and selenium.

LEAD SILICATE. See lead-*m*-silicate.

LEAD-*m*-SILICATE. Syn: *alamosite*. White crystalline powder. $PbSiO_3$, mw: 283.27, mp: 766°, d: 6.49.
THR = See lead compounds.

LEAD STEARATE. White powder. $Pb(C_{18}H_{35}O_2)_2$, mw: 774.1, mp: 115.7°.
THR = See lead compounds.

LEAD STYPHNATE. See lead trinitroresorcinate.

LEAD SULFATE. Syn: *anglisite*. White rhombic crystals. $PbSO_4$, mw: 303.27, mp: decomp @ 1000°, d: 6.2.
Acute tox data: ip LD_{50} (guinea pig) = 300 mg/kg. [*3*]
THR = HIGH via ip route. A strong irr to skin, eyes and mu mem. See lead compounds. Violent reaction with K. [*19*]

LEAD SULFIDE. Syns: *galena, plumbous sulfide*. Silvery, metallic crystals or black powder. PbS, mw: 239.27, mp: 1114°, bp: 1281° (sublimes), d: 7.5, vap. press: 1 mm @ 852°.
Acute tox data: ip LD_{LO} (rat) = 1847 mg/kg. [*3*]
THR = MOD via ip route. See also sulfides and lead compounds. Violent reaction with ICl, H_2O_2. [*19*]

LEAD SULFITE. White powder. $PbSO_3$, mw: 287.28.
THR = See lead compounds and sulfites.

LEAD SULFOCYANATE. Syn: *lead thiocyanate*. Monoclinic white crystals. $Pb(SCN)_2$, mw: 323.37, d: 3.82.
THR = See lead compounds and thiocyanates.

LEAD TARTRATE. White crystalline powder. $PbC_4H_4O_6$, mw: 355.28, d: 2.54 @ 19°.
Acute tox data: ip LD_{LO} (rat) = 1200 mg/kg. [*3*]
THR = MOD via ip route. See lead compounds.

LEAD TELLURIDE. Syn: *altaite*. White cubic crystals. PbTe, mw: 334.82, mp: 917°, d: 8.16.
THR = See lead compounds and tellurium compounds.

LEAD TETRAACETATE. Colorless to faintly pink monoclinic crystals. $Pb(CH_3COO)_4$, mw: 443.39, mp: 175°, d: 2.228 @ 17°.
THR = See lead compounds.

LEAD TETRAAZIDE. $Pb(N_3)_4$, mw: 355.3.
THR = Very unstable. [*19*] Probably HIGH toxicity. See also lead compounds and azides.

LEAD TETRACHLORIDE. Yellow, oily liquid. $PbCl_4$, mw: 349.04, mp: −15°, bp: explodes @ 105°, d: 3.18 @ 0°.
THR = See lead and hydrochloric acid.

LEAD TETRAETHYL. Syn: *TEL*. Colorless, oily liquid, pleasant characteristic odor. $Pb(C_2H_5)_4$, mw: 323.5, mp: 125°–150°, bp: 198°–202° with decomp, d: 1.659 @ 18°, vap. press: 1 mm @ 38.4°, flash p: 200°F.
Acute tox data: Oral LD_{LO} (rat) = 17 mg/kg; inhal LC_{50} (rat) = 6 ppm; pa LD_{50} (rat) = 15 mg/kg; dermal LD_{LO} (dog) = 500 mg/kg; dermal LD_{LO} (guinea pig) = 990 mg/kg. [*3*]
THR = HIGH via oral, inhal, pa and dermal routes. This material is a powerful poison and a solvent for fatty materials. It has some solvent action on rubber as well. The fact that it is a lipoid sol-

vent makes it an industrial hazard, because it can cause intoxication not only by inhal but also by absorption through the skin. Decomp when exposed to sunlight or allowed to evaporate; forms triethyl lead, which is also a poisonous compound, as one of its decomp products. This liquid lead compound, when handled in undiluted form or concentrated solution as when it is manufactured or in the plants where it is mixed with gasoline, may cause lead exposure intoxication by coming in contact with the skin. Therefore, any open receptacle which contains these liquids in high conc or any container, article of clothing, or any other object which is not kept clean, particularly in contact with this material, may subject personnel to serious lead exposure. An exper (±) carc. [*3, 6*] A common air contaminant.

Fire Hazard: Mod, when exposed to heat, flame or oxidizers.

Disaster Hazard: Dangerous; see lead; can react vigorously with oxidizing materials.

To Fight Fire: Dry chemical, CO_2, mist, foam.

LEAD TETRAFLUORIDE. Syn: *plumbic fluoride.* White crystals, reacts with moisture. PbF_4, mw: 283.2, d: 6.7, mp: 600° (approx).

THR = See lead compounds and fluorides.

LEAD TETRAMETHYL. Syn: *tetramethyl lead.* Colorless liquid. $Pb(CH_3)_4$, mw: 267.33, mp: −18°F, lel = 1.8%, bp: 110°, d: 1.99, vap. d: 9.2, flash p: 100°F.

Acute tox data: Oral LD_{50} (rat) = 109 mg/kg; pa LD_{50} (rat) = 105 mg/kg; ip LD_{LO} (rat) = 73 mg/kg; iv LD_{LO} (rabbit) = 90 mg/kg. [*3*]

THR = HIGH via oral, pa, ip and iv routes. See also lead and lead tetraethyl. An exper (±) carc. [*3, 6*]

Fire Hazard: Dangerous, when exposed to heat, flame or oxidizers.

Explosion Hazard: Mod, in the form of vapor when exposed to flame.

Disaster Hazard: Dangerous; see lead; can react vigorously with oxidizing materials.

To Fight Fire: Water, foam, CO_2, dry chemical.

LEAD THIOCYANATE. See lead sulfocyanate.

LEAD THIOSULFATE. Syn: *lead hyposulfite.* White crystals. PbS_2O_3, mw: 319.33, mp: decomp, d: 5.18.

THR = See lead compounds.

Disaster Hazard: Dangerous; See lead and SO_x.

LEAD-*m*-TITANATE. Pale yellow solid. $PbTiO_3H$, mw: 304.1, d: 7.52.

Acute tox data: ip LD_{50} (rat) = 2000 mg/kg. [*3*]

THR = MOD via ip route. See also lead and titanium compounds.

LEAD TRINITRORESORCINATE. Syn: *lead styphnate.* Orange-yellow, monoclinic crystals. $C_6H(NO_2)_3(O_2Pb)$, mw: 450.30, mp: explodes @ 311°, d: 3.1–2.9.

THR = See lead compounds and nitrates. Very sensitive explosive. It is shock-sensitive and has detonated spont when dry. [*19*]

Fire Hazard: See nitrates and explosives, high.

Explosion Hazard: Severe, when heated.

Disaster Hazard: Dangerous; explodes at 311°.

LEAD TUNGSTATE. Syn: *lead wolframate.* Yellowish powder. $PbWO_4$, mw: 455.13, d: 8.235.

THR = See lead compounds and tungsten compounds.

LEAD-*m*-VANADATE. Yellow powder. $Pb(VO_3)_2$, mw: 405.11.

THR = See lead and vanadium compounds.

LEAD WOLFRAMATE. See lead tungstate.

LEATHER.

THR = A MILD allergen. Handling "green" hides from certain parts of the world can bring about contact with anthrax spores. Furthermore, tanning can introduce materials such as chromium, formaldehyde, etc.

Fire Hazard: Slight, when exposed to heat or flame; can react with oxidizing materials.

LEATHER BLEACH.

THR = U.

Fire Hazard: Dangerous, when exposed to heat or flame.

Explosion Hazard: U.

Disaster Hazard: Mod dangerous; when heated to decomp, emits toxic fumes; can react with oxidizing materials.

To Fight Fire: Foam, CO_2, dry chemical.

LEATHER DRESSING. Flash p: < 80°F.

THR = U. Some dressings may act as irr or allergens.

Fire Hazard: Dangerous, when exposed to heat or flame; can react with oxidizing materials.

Explosion Hazard: U.

To Fight Fire: Foam, CO_2, dry chemical.

LECITHIN. The lecithins are mixtures of diglycerides of fatty acids linked to the choline ester of phosphoric acid. They are classified as phosphoglycerides or phosphatides.

$CH_2(R)CH(R')CH_2OPO(OH)O(CH_2)_2N(OH)(CH_3)_3$ where R and R' are fatty acid groups.

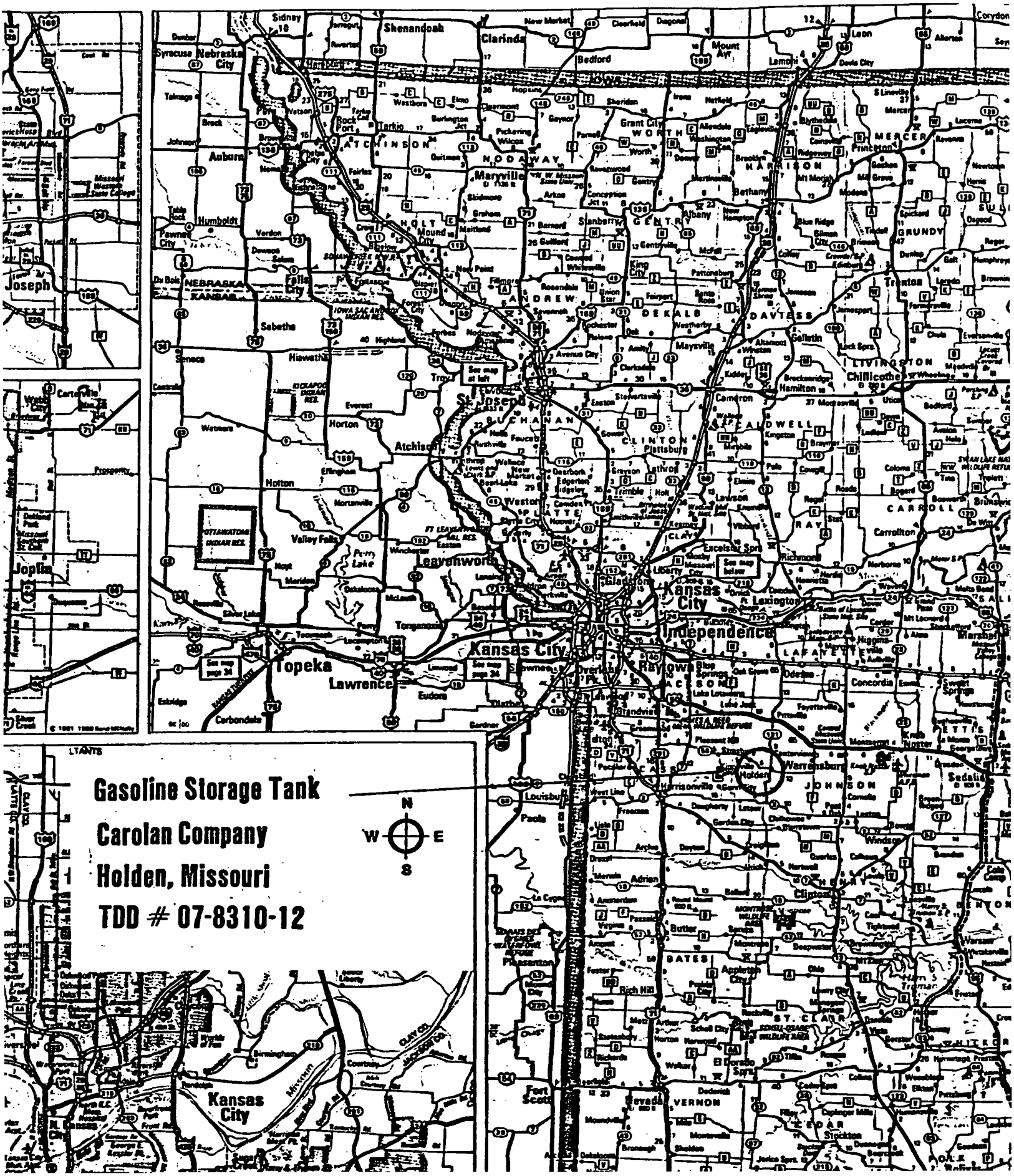
THR = U. Probably LOW. Used as a general purpose food additive. It is a substance which migrates to food from packaging materials. [*109*]

"LEDATE." See lead dimethyl dithiocarbamate.

LEGAL MEDICINE. See forensic toxicology.

LENACIL. See venzar.

SITE LOCATION



AGREEMENT TO ALLOW ENTRY TO PREMISES
FOR ENVIRONMENTAL INVESTIGATION

RIGHT OF ENTRY TO PREMISES. Carslaw Co., Grantor(s), as legal owner(s) of or as lessee(s) with authority to permit access to the below described property, hereby knowlingly consents to and authorizes the United States Environmental Protection Agency (EPA) or its contractor, Grantee, to enter upon and perform certain investigative activities:

DESCRIPTION: Hazardous Waste Treatment

STREET OR LOCATION: 500 W. Mc Kissock 816-732-4117

CITY/TOWN: Holden

COUNTY: Johnson

STATE: MO. 64040

PURPOSE OF INVESTIGATION. The purpose of the investigation is to evaluate the nature and the extent of possible chemical contamination of the above-described property which may have resulted from past activities involving the disposal of contaminated wastes on the property or nearby property.

INVESTIGATIVE ACTIVITIES. The investigation activities are expected to include:

a. The collecting and taking of such soil, water, air, and other samples as may be determined to be necessary by grantee. This may include entry into and sample collection from buildings and other structures on said property.

b. The drilling of holes for subsurface investigation, in road areas, including the use of drilling rigs, trucks and other equipment as necessary; and

c. Other actions related to the investigation of surface or subsurface contamination from wastes deposited on the property or nearby, specifically:

_____

_____

_____

TERM OF AGREEMENT. The activities authorized under this agreement are expected to be completed on or before the 1 day of NOV., 1983, and all rights and privileges given by Grantor(s) shall cease on that date, unless extended by subsequent agreement.

AGREEMENT NOT TO INTERFERE. Grantor(s) agrees not to interfere with any of the activities described herein, or to undertake any actions regarding the use of the property which would tend to endanger the health or welfare of the Grantee(s), or to allow others to use the property in such a manner.

RESTORATION OF PROPERTY. The Grantee agrees that, with the exception of any ground markers which may be placed on the premises to designate sampling areas, all material and equipment utilized by Grantee shall be removed from the property upon the completion of the investigations and activities authorized by this agreement.

The undersigned have read this Agreement and understand that it grants permission to the EPA or its contractors to enter the above-described premises for purposes of conducting an environmental investigation and agree to its terms and conditions.

GRANTORS

Dwight E. Thomas R&D — 10-13-83
NAME — DATE

NAME — DATE

GRANTEE

Michael L. Clemons Reg III TAT — 10-13-83
NAME — DATE

DETAILED SAMPLE INFORMATION SHEET

FOR

SAMPLE NO. AK0101

Feb ptl 2.5 Explosimeter 15% LEL

Hnu 20-40 ppm

POTENTIAL SUBSTANCE IN THIS SAMPLE:
Petroleum Hydrocarbon Sludge

POTENTIAL CONCENTRATION OF SUBSTANCE IN THIS SAMPLE:

	HIGH	MED	LOW	UNK
	✓			

STATE OF SAMPLE IS:

GAS	LIQ	SOLID	SLUDGE
			✓

SUBSTRATE OF THE SAMPLE IS:

✓ UNDILUTED	AIR		WATER
SEDIMENT	SOIL		OTHER

POSSIBLE HAZARDS OF SAMPLE:

✓ IGNITABLE	✓ VOLATILE	✓ CORROSIVE
REACTIVE	RADIOACTIVE	EXPLOSIVE
UNKNOWN		

POTENTIAL TOXICITY OF SAMPLE:

HIGH	MED	LOW	UNK
✓			

POSSIBLE ROUTE OF TOXICITY:

DERMAL	INHAL	INGEST	UNK
✓	✓	✓	

****

ANALYSES REQUESTED: Priority Pollutant / GCM & / metals

DETECTION LIMITS REQUESTED:

PPB	PPM	%	QUAL
	✓		✓

TURNAROUND TIME REQUESTED:

DAYS	WEEKS

FIELD SHEET

ENVIRONMENTAL PROTECTION AGENCY — REGION VII
SURVEILLANCE AND ANALYSIS DIVISION, 25 FUNSTON ROAD, KANSAS CITY, KANSAS 65115

STATION IDENTIFICATION

SURVEY NO. _____ SURVEY LEADER Clemons - TAT STORET NO. AK0101

DESCRIPTION Hokkan, MO - Carolan Company - Sludge from 12000 gal TANK

GRAB SAMPLE DATA

FLOW	TEMP °C AIR 00020	TEMP °C WATER 00010	PH	DO	FECAL COLI	OIL & GREASE	OTHER	OTHER
☐ 00059 (GPM) ☐ 00061 (CFS)								

COLLECTION DATE YR _____ MO _____ DAY _____ TIME _____ SAMPLER NAME CODE _____ LAB NO. _____

			00400					

COLLECTION DATE YR _____ MO _____ DAY _____ TIME _____ SAMPLER NAME CODE _____ LAB NO. _____

COLLECTION DATE YR _____ MO _____ DAY _____ TIME _____ SAMPLER NAME CODE _____ LAB NO _____

COLLECTION DATE YR _____ MO _____ DAY _____ TIME _____ SAMPLER NAME CODE _____ LAB NO. _____

COMPOSITE SAMPLE DATA

BEGIN DATE: YR _____ MO _____ DAY _____ TIME _____ LAB NO. AK0101

END DATE: YR _____ MO _____ DAY _____ TIME _____ EQUIPMENT CODE: _____

FLOW RATE _____ (50050) MGD _____ (50052) 1000 s OF GAL DURING COMPOSITE PERIOD SAMPLER NAME CODE _____

WATER CHEMISTRY

LAB NO. _____

SAMPLE CONTAINER	TAG COLOR	PRESERVATIVE	LABORATORY MOBILE	LABORATORY REGION	ANALYSES
Pint Jar	Purple			✓	PP 15/ GC/MS Metals

CONTACT: Clemons / Keffer SAMPLE ☑ YES ☐ NO SPLIT Carolan Company

REMARKS: TANK supposedly had Premium leaded gasoline in it for the last 20 years. Rupe who had previously come in contact with product had received blisters on dermal contact. Field ptl read 2.5.

7-EPA-9263 (6/75) GSA-KC-75-0862S

EPA, Region VII
25 Funsten Road
Kansas City, Kansas 66115

Receipt for ~~Environmental~~ HAZARDOUS Samples

From: Facility Name CAROLAN Co., INC
Address 500 W MISSOURI
City Holden, MO. 64040
Permit Number
Responsible Official and Title R&D

Laboratory Sample No.	Types of Containers (No. of Containers per Lab No.)				Description of Samples
	Cubitainer	Glass Jar	DO Bottle	Bio Bottle	
AK0101		1			Sludge from TANK bottom

Acknowledgement

The undersigned acknowledge receipts for the above described samples pursuant to:

- ☐ Section 3007(a) of the Recource Conservation and Recovery Act, 42USC6927CAL
- ☐ Section 308(a)(b) of the Clean Water Act
- ☐ Section 117(a)(2) of the Clean Air Act
- ☑ Other (Specify) CERCLA

Duplicate samples were/were not requested by the responsible facility representative.
Duplicate samples were/were not provided to the responsible facility representative.
or his designated agent.

Signature and Title of Responsible Facility Official

Signature: [signature] Title: R&D

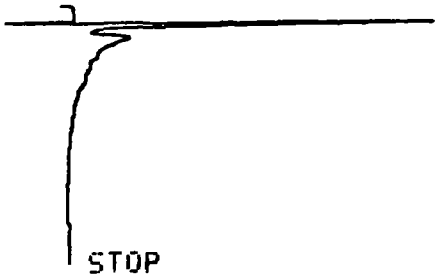
Date of Signing 10-12-83

Name and Title of Person Collecting Samples

[signature] Reg. VII TAT
Signature of Collector

Needle Test

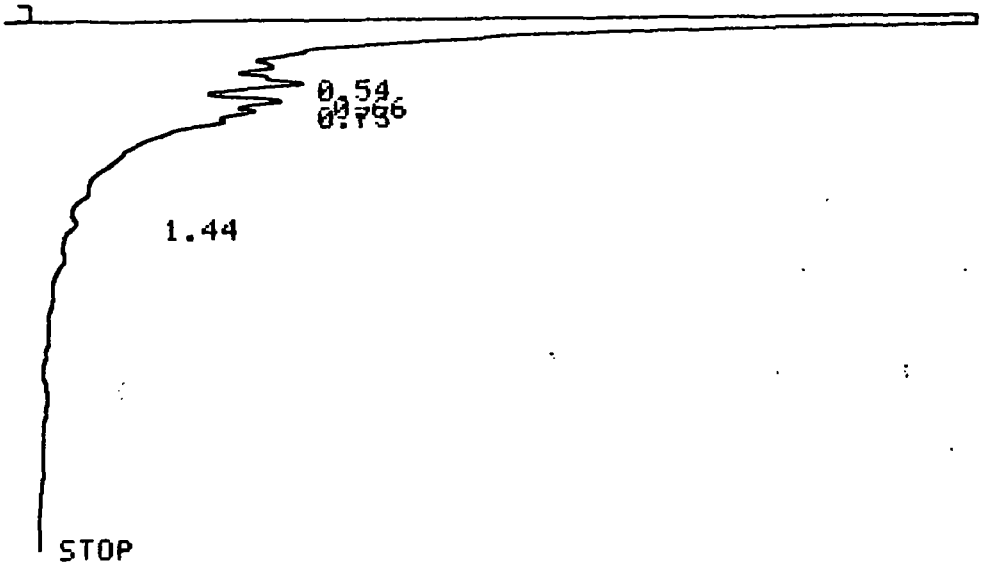
START 10.12.20.04.



C-R1B
SMPL # 00
FILE # 5
REPT # 2756
METHOD 1044

#	NAME	TIME	CONC	MK	HEIGHT
	TOTAL		0		0

LEVEL -9.2
LEVEL 5.8
LEVEL 5.6
LEVEL -0.8
SBST TANK
ATT 128V4UL
START 10.12.20.08.

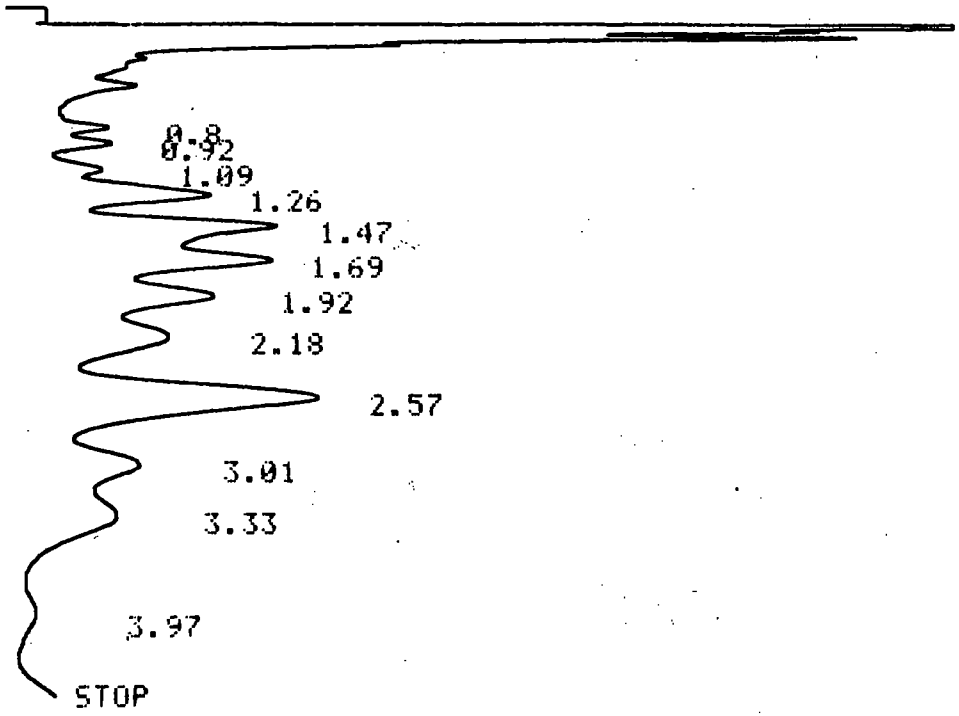


C-R1B
SMPL # 00
FILE # 5
REPT # 2757
METHOD 1044

#	NAME	TIME	CONC	MK	HEIGHT
1		0.54	1.5437		58
1		0.66	2.3343		88
1		0.73	2.0115	V	76
	TOTAL		5.8895		223

IS WT 1

START 10.12.19.52.



C-R1B
SMPL # 00
FILE # 5
REPT # 2753
METHOD 1044

#	NAME	TIME	CONC	MK	HEIGHT
1		0.8	2.1981		55
1		0.92	2.4278	V	61
1		1.09	2.1184		53
1		1.26	6.7528	V	170
1		1.47	9.6453	V	243
1		1.69	9.5903	V	242
1		1.92	7.2341	V	182
1		2.18	5.4498	V	137
1		2.57	11.9615	V	302
1		3.01	4.5593	V	115
1		3.33	3.7276	V	94
1		3.97	0.5699		14
	TOTAL		66.2354		1672

ID TBL 5

#	TIME	BAND	F1/F2	C1/C2
1	4.5	100	0	44
2	END			

SPL WT 4
CALIB 1

C-R1B
SMPL # 00
FILE # 5
REPT # 2754
METHOD 1044
CLB C1 1

#	NAME	TIME	CONC	MK	HEIGHT
1		0.8			55
1		0.92		V	61
1		1.09			53
1		1.26		V	170
1		1.47		V	243
1		1.69		V	242
1		1.92		V	182
1		2.18		V	137
1		2.57		V	302
1		3.01		V	115
1		3.33		V	94
1		3.97			14
	TOTAL		0		1672

ID TBL 5
MAX 14
MODE 2

#	TIME	BAND	F1/F2	C1/C2
1	4.5	100	0.001052	44